



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: LA2521

Title: Storm Water Transport of Particulate Matter From Elevated Urban Transportation Corridors into Waterways of Louisiana - The Role of Partitioning and Implications For Treatment

Focus Categories: Non Point Pollution, Hydrology

Keywords: Urban Hydrology, Granulometry Elevated Infrastructure, Storm water, Mitigation, Unit Operations and Processes, Granulometry, Heavy Metals, Particle Transport, Best Management Practices (BMP)

Start Date: 03/01/2001

End Date: 02/28/2002

Federal Funds: \$12,000

Non-Federal Matching Funds: \$29,669

Congressional District: 6th

Principal Investigators:

John Joseph Sansalone
Assistant Professor, Louisiana State University

Frank K. Cartledge
Professor, Louisiana State University

Marty Tittlebaum
Professor, University of New Orleans

Abstract

A fundamental understanding of the nature and extent of storm water pollution integrated with the development of sustainable treatment and re-use of storm water is coming of age in the USA. To ensure sustained progress, questions associated with the nature and transport of nonpoint constituents in storm water must be addressed. Storm water quality is now a major urban environmental issue and storm water is becoming the wastewater of focus for the new century. The first step towards potential water quality benefits through processes of control or treatment is an understanding of the transport, granulometry and partitioning in these linearly extended non-point sources of pollution. Results from this research will provide a fundamental characterization of the transport, granulometry and partitioning of elevated transportation corridor storm water at two instrumented sites in Louisiana. One site is located in urban Baton Rouge at I-10 over City Park Lake and in urban New Orleans at the I-10, 610 split over the 17th Street Canal. There are a number of benefits of this research. (1) Results from this work will assess granulometric properties of storm water particulate matter including particle number gradations concentrations for particles 1-mm and larger in diameter, mass gradations and particle densities and surface areas. (2) Heavy metal partitioning between the dissolved and particulate-bound fractions and mass distribution with respect to particle gradation will be examined. (3) The concept of a so-called "first-flush" for both particulate matter and dissolved constituents will be examined. (4) Results of this research will not only provide a fundamental characterization of nonpoint constituents and their transport but also provide guidance for the development of BMPs utilizing unit operations and processes based on the knowledge of storm water loadings.

This nature of this research is to provide a fundamental examination of dissolved and particulate transport, entrained particulate granulometry and heavy metal partitioning in storm water from elevated transportation corridors in Louisiana. The scope of this work will be carried out at two experimental sites are available for this research; one in urban Baton Rouge and one in urban New Orleans, both urban areas are designated NPDES Phase II areas. The scope will encompass the capture of at least one rainfall runoff event each month. Each captured event will be fully sampled and analyzed. Pursuant to the nature and scope of this research there are a number of specific objectives of this research. For full water quality, hydrologic and transport characterization, discrete samples, flow and rainfall measurements will be taken throughout the duration of each captured event.

The scope and objectives of the research will lead to a number of deliverables. These deliverables include:

1. Submission of two peer-reviewed publications on research findings,
2. Two conference presentations at the State or National level,
3. Support of one M.S. student in pursuit of their graduate degree and a research experience for one undergraduate student,
4. Information and research transfer to the academic classroom and laboratory,
5. Final report,
6. Pursue additional funding sources at the state and national levels.